



FOURTH ANNUAL REPORT OF PROGRESS ON CHILDREN'S HEALTH ISSUES
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
TOXICS STEERING GROUP

January 21, 2005

I. Introduction

This fourth annual report presents the findings and recommendations of the Michigan Department of Environmental Quality (MDEQ) Toxics Steering Group (TSG) for ensuring adequate protection of children's health. Specifically, this report documents the TSG's progress over the last year in implementing the recommendations from the Michigan Environmental Science Board (MESB) report entitled, *Analysis of the Michigan Department of Environmental Quality's Administered Environmental Standards to Protect Children's Health*, and directives from the March 17, 2000, memo from former MDEQ Director Russell Harding supporting those recommendations. Progress is also reported on additional recommendations and priorities identified in the previous annual reports.

II. Summary of the MESB Children's Standards Investigation Panel Recommendations and Corresponding TSG Actions and Recommendations for Implementation

The MESB Children's Standards Investigation Panel (MESB Panel) recommendations are summarized below. Specific TSG actions taken in response to these and to recommendations from previous annual reports are provided below each MESB Panel recommendation.

- A. The MESB Panel recommended that the MDEQ TSG's interactions with toxicological, epidemiological, and risk assessment staff in other state departments be increased.

RESPONSE: The TSG recommended that efforts to increase the MDEQ's interactions with other state agencies continue. The TSG continues to operate with membership from the Michigan Department of Agriculture (MDA) represented by Dr. Brian Hughes of the Pesticide and Plant Pest Management Division, and the Michigan Department of Community Health (MDCH) represented by Dr. Linda Dykema, Christina Bush, Erik Janus, and Kory Groetsch of the Environmental and Occupational Epidemiology Division.

The TSG continues to meet on a regular basis. TSG members from other state agencies participate on several subcommittees and efforts to coordinate with other agencies will continue to be pursued when opportunities arise. The MDA and MDCH have designated representatives on the TSG's Children's Environmental Health Subcommittee (CEHS).

- B. The MESB Panel recommended that the MDEQ continue to incorporate the best available science in the development and review of its environmental standards, and identified specific areas in which to focus initial efforts. The MESB Panel made two specific recommendations concerning the MDEQ soil direct contact criteria (chemical criteria protective of incidental ingestion of soil), developed under the authority of Part 201, Environmental Remediation, of the Natural Resources and Environmental

Protection Act, 1994 PA 451, as amended. First, the MESB Panel recommended that occasional high intakes of soil, rather than average daily chronic intakes, be considered in the development of these criteria in some cases. Second, the MESB Panel recommended that the MDEQ consider exposure to the same substances through other exposure routes, such as water and food in the development of soil direct contact criteria.

RESPONSE: The TSG recommended that the MDEQ identify those compounds for which an occasional high intake of soil may pose an acute health risk and develop direct contact criteria protective of this exposure scenario. This was identified as a low priority recommendation. Although it has been discussed and a process drafted for identification of acutely toxic hazardous substances, no work has been completed to date. This issue will be evaluated as criteria are revised or new criteria are developed. A reevaluation of the current criteria will be done only as time and resources allow; however, since the criteria are promulgated in the Part 201 Rules, revisions to promulgated criteria will be difficult and adoption of the revisions will likely take years.

In addition, the TSG recommended that algorithms for the calculation of direct contact criteria be developed for a child-only receptor and that these algorithms be considered for use in developing criteria for land uses where children may be expected to be present (e.g., the residential exposure scenario). This has also been identified as a low priority recommendation. Child-only direct contact criteria have been drafted by the Remediation and Redevelopment Division (RRD); however, because it is a low priority recommendation and because the criteria are in the Part 201 Rules, no further work on these criteria has been pursued.

Further, the TSG recommended that a relative source contribution factor less than one (i.e., less than 100 percent) be used to develop soil direct contact criteria where chemical-specific information is available. This option is currently available under the existing Part 201 Rules; however, an update of the scientific literature has not been conducted to determine if more chemical-specific relative source contribution factors can be developed. It is currently identified as a low priority recommendation and will likely be addressed only for some chemicals as criteria are revised or new criteria are developed. Again, since the criteria are promulgated in the Part 201 Rules, revisions to the criteria will be difficult and time consuming.

- C. The MESB Panel recommended that it be a high priority for the MDEQ to collect high quality hazardous air pollutant data and conduct a risk assessment. They also noted that the recommended risk assessment should be used to prioritize the hazardous air pollutants based on estimated relative risk and the contribution that air exposures make to overall risk from the hazardous air pollutants. The MESB Panel recommended a periodic update of screening levels and that "total risk" be assessed.

RESPONSE: The MDEQ Air Quality Division (AQD) completed the development of an air toxics monitoring strategy to address the need for high quality data on toxic air contaminants. The details of this strategy are provided in the June 27, 2002 report entitled, *The Development of an Air Toxics Monitoring Strategy for Michigan*. While funding is not currently available to implement this strategy, it will be used as a guide to help implement an expanded air toxics monitoring program should future funding become available.

During April 2001 to April 2002, the AQD conducted an intensive air toxics monitoring program in the Detroit area through a grant funded by the United States Environmental

Protection Agency (EPA). The data from this monitoring study are currently being used to conduct a risk assessment for air toxics in the Detroit area. This project, the *Detroit Air Toxics Initiative*, is also being funded through the EPA.

The results from the *Detroit Air Toxics Initiative* combined with data compiled through various EPA efforts, such as the National Air Toxics Assessment, can be used to help prioritize screening level updates. However, a comprehensive strategy is needed for a routine update of all screening levels, not just for those compounds for which monitoring data are available.

To further implement the MESB Panel's recommendation, the TSG recommended that a procedure be developed for a routine update of all screening levels considering all new and relevant information. This was identified as a high priority recommendation. No activity has taken place on this recommendation due to staffing limitations and other program priorities.

- D. The MESB Panel recommended that the MDEQ continue to monitor the EPA's efforts to assess drinking water and surface water standards for protection of children's health and consider application of new EPA approaches to Michigan standards as they are validated.

RESPONSE: The TSG recommended that the MDEQ continue to track new and revised federal drinking water and surface water standards and incorporate these as appropriate. This was identified as a high priority recommendation. Several MDEQ divisions routinely monitor federal and state drinking water and federal surface water standards and incorporate new or revised standards into Michigan programs as appropriate. Consistency across divisions and programs is a primary objective when incorporating new or revised standards so that all MDEQ programs that rely on a set of standards or criteria are using the same values. Activities to implement the MESB Panel's recommendation include the following:

- The Water Bureau (WB) currently tracks all changes in federal surface water quality and drinking water standards, and incorporates these changes into rules when appropriate. The WB is in the process of incorporating the maximum contaminant level for arsenic into state rules.
- The RRD currently monitors the promulgation of both federal and state drinking water standards. Section 20(a)(5) of Part 201 states that if a state drinking water standard exists for a hazardous substance, the drinking water criterion is the more restrictive of that state standard and the aesthetic criterion if one is available. It generally takes a minimum of one year for a federal drinking water standard to be promulgated as a state standard. Therefore, because Part 201 specifically refers to a "state standard," a Part 201 drinking water criterion may not be consistent with the federal safe drinking water act. No state standards were promulgated over the course of the past year, however, the RRD continues to monitor both the federal and state drinking water standards.

The TSG also recommended that the MDEQ monitor the EPA's efforts to revise methods for calculation of drinking water and surface water standards for protection of children's health and incorporate these revised methods as appropriate. This was identified as a high priority recommendation. The RRD and the WB routinely monitor information from the relevant EPA offices in the area of children's health issues. Other sources that would provide information regarding children's health and risk

assessment methods are also monitored on a routine basis. As of October 2004, no new information, since the last annual report, (e.g., Draft Cancer Guidelines for Children) regarding upcoming changes to standards or risk assessment methods had been identified.

- E. The MESB Panel recommended that the MDEQ risk assessors maintain their scientific strengths by taking advantage of education opportunities offered through various scientific societies, symposia, and the federal government. Such efforts would allow the scientific staff at the MDEQ to continue to appropriately use the most current risk assessment techniques.

RESPONSE: The TSG supported this recommendation. Staff have attended various events (see Section 4a-g).

- F. The MESB Panel recommended that the MDEQ incorporate the concepts of mixtures and cumulative risk into its regulatory risk assessment process as the science matures.

RESPONSE: The TSG formed the Mixtures and Cumulative Risk Subcommittee.

Mixtures and Cumulative Risk Subcommittee

Chair: Bob Sills, AQD

This subcommittee is charged with evaluating the available approaches for performing toxicological risk assessment for exposures to mixtures of substances, as well as cumulative exposure and risks. The subcommittee will consider how and if these approaches may be appropriately applied in the MDEQ regulatory programs. This is an extremely broad and challenging subject to address, with potentially wide ramifications to all of the MDEQ's regulatory risk assessment programs. Guidance and examples from the EPA and other agencies are reviewed as they become available. Issues are being addressed on a case-by-case basis.

- G. The MESB Panel recommended that the MDEQ continue to keep abreast of the new information emanating from the federal government, academia, and scientific literature regarding the impact of environmental contaminants on children's health.

RESPONSE: The TSG formed the CEHS.

Children's Environmental Health Subcommittee

Chair: Mary Lee Hultin, AQD

Vice Chair: Amy Merricle, RRD

This subcommittee is charged with tracking developments in the area of children's environmental health and making recommendations to the TSG for incorporation into human health risk assessment procedures, as appropriate. The subcommittee chair regularly updates the TSG on current activities of the CEHS. The objectives of this subcommittee and associated actions since the last annual report include the following:

1. Track the latest scientific findings in the area of children's environmental health: The subcommittee continues actively tracking the latest scientific findings in this area. The MDEQ librarian monitors new literature for publications in this area. All members of this subcommittee monitor the literature via periodical reviews and the Internet (e.g., CHESHIR, NCEA). A database has been developed listing reports

and studies reviewed and critiqued by the group. The current contents of this database are included as Appendix A.

2. Efforts continue to identify activities in other states in the area of children's environmental health. The group has been tracking developments regarding the Minnesota Health Department's groundwater rule revision. The Minnesota Health Department has proposed alterations in the exposure assumptions for their health risk limits in order to account for differential water intake by children. They have also proposed a cancer risk adjustment to account for different susceptibility in children. The CEHS members reviewed these proposals and participated in dialogue with Minnesota staff about their process. Members of the subcommittee participated in the Minnesota stakeholders' meeting in July 2004, via teleconference. Members have also followed children's health activities under California's Air Toxics Program.
3. Members continue to track activities at the federal level as time and resources allow via the *Federal Register* and other announcements, however, most of the activities coincide with other subcommittee objectives.

Members are charged with tracking results of the individual research findings pertinent to their divisions/department areas of responsibility.

- The chair of the CEHS participated in a meeting where information on the EPA's Clean School Bus USA program was described. A number of grant proposals have been written to obtain funding for reducing exposure to diesel emissions, especially from school buses. One successful grantee provided a demonstration on school bus diesel retrofit technology, which the CEHS chairperson attended.
 - Two members of the CEHS, in collaboration with staff from the MDCH, University of Michigan, and Michigan State University (MSU) are working on a Centers for Disease Control (CDC)-funded project examining potential associations of criteria air pollutants in two Michigan counties with adverse birth outcomes. A poster of preliminary findings was presented at International Society for Environmental Epidemiology in August 2004.
 - Two CEHS members continue to work on projects in collaboration with the MDCH on environmental triggers of asthma, including prevention of exposure to children, as part of the statewide asthma strategic plan.
 - The chair of the CEHS participated in a meeting with the EPA, MDEQ, and MDCH representatives on the proposed EPA Children's Health Study to be conducted in Detroit.
 - The CEHS chair has been tracking studies on air pollution in children being planned and conducted in Canada and the United States as part of the United States/Canada border air quality study, Detroit/Windsor pilot project.
4. The CEHS members participated in a number of conferences/workshops on issues related to children's environmental health and risk assessment. The members brought information back to the TSG and subcommittees to expand our knowledge base. Participation in the following events allowed for information sharing between other states in the area of children's environmental health:

(a) 2004 Polychlorinated Biphenyl (PCB) Workshop

Two members of the CEHS attended the PCB workshop, sponsored by the University of Illinois, College of Veterinary Medicine, in Champaign, Illinois on June 13-15, 2004. This workshop provided an opportunity for researchers of varied backgrounds and expertise to integrate their knowledge and experience and discuss issues related to the detection, movement, metabolism, toxicity, remediation, and risk assessment of PCBs and related environmental pollutants.

Conference presentations were divided into the following sessions:

- Origins of PCBs and Characterization of Exposure
- Human Exposures/Health Effects and Characteristic Congener Profiles
- Actions of PCBs: Endocrine Effects
- Cardiovascular Targets of PCBs
- Combined Exposures to PCBs and Other Contaminants
- Risk Issues

Developmental and other health effects in children were discussed in each session. Key findings related to children's health:

- Slovakian Study: Robust association between PCBs and several health outcomes in children including hearing loss, dentition, neurobehavioral deficits (sensory motor effects, memory effects, hyperactivity), increased incidence of female babies
- Multiple mechanisms of thyroid toxicity: Developmentally, PCBs were reported to exhibit anti-thyroid and thyro-mimetic effects (increased expression of thyroid hormone responsive genes)
- Cardiovascular: Vascular development and developmental heart defects were reported
- Critical windows of susceptibility: Early life exposure may alter later susceptibility, behavioral and cognitive effects were consistent following early life exposure in children
- Questions raised: Could PCBs be part of the increase seen in autism? Attention deficit hyperactivity disorder? Learning disabilities?

(b) The MDCH representative to the CEHS attended the 2004 Agency for Toxic Substances and Disease Registry (ATSDR) Partners in Public Health meeting in Atlanta in March. The theme of the meeting was "Strengthening Environmental Public Health." Among the seminars attended was "Uncontrolled Asthma and Exposure to Air Pollution," which linked the California Health Interview Survey (CHIS) data with air pollutant, traffic density, and census data. The CHIS is the largest statewide health survey in the nation: 55,428 adults, 5,801 teens, and 12,592 children participated in 2001. The survey includes questions about asthma (see <http://www.chis.ucla.edu/>). The study was about half completed as of the date of the meeting. Preliminary findings regarding ozone and asthma symptom frequencies suggest that living in areas with high ozone levels, being in the low or middle income bracket, being female, and being 65 years or older increases one's risk.

The following fact sheets, generated by the ATSDR, covering "Your Child's Environmental Health," were obtained at the conference and distributed to the entire TSG:

- How the Body Works: Differences Between Adults and Children
 - What Puts Young Children at Risk?
 - Environmental Exposure During Your Pregnancy and Your Child's Infancy
 - Exposure Routes in Elementary-School and Middle-School Children
 - Adolescent Exposure Routes
 - How to Protect Your Children: Prevent and Reduce Their Exposure
 - Keeping Your Child Safe
- (c) Two members of the CEHS attended the conference, *DDT's Effects on Human Health*, presented by Matthew Longnecker from the National Institute of Environmental Health Sciences. Over 50,000 pregnancies were studied, children being followed to age seven. Women exposed to low or medium levels of dichlorodiphenyltrichloroethane (DDT) experienced spontaneous abortion, preterm births, and had small-for-gestational-age babies. Children born to mothers in low- and medium-exposure groups showed decreased relative height in girls, increased relative height in boys, and increased blood pressure. In these offspring, there was decreased fecundability in females relative to increased DDT exposure. There was increased fecundability in male offspring relative to increased dichlorodiphenyldichloroethylene (DDE) exposure.
- (d) Several members of the CEHS attended the teleconference "Lead-Associated Neurobehavioral Impairments in Young Children," presented by Richard L. Canfield, Cornell University. The critical point from this seminar was that Dr. Canfield believes there is no threshold blood lead level: data indicate that children show health effects at blood lead levels below 10 micrograms per deciliter, a level currently held to be safe by regulatory and health agencies. While the CDC concurs that there is no threshold blood lead level, the action level (the point at which intervention occurs) remains at 10 mg/dL.
- (e) Two members of the CEHS attended the presentation "Allergy and Asthma Research Program at Henry Ford Health System: Latest Research Results," by Dr. Christine Johnson from Henry Ford Health System. Dr. Johnson discussed the theories of asthma etiology. She then discussed the Childhood Allergy and Asthma Study and the Wayne Tri-County Health Environment Allergy and Asthma Longitudinal Study.
- (f) Two members from the CEHS attended the seminar "Predicting Lead Risk in Children from Census Information, Distances from Lead Emissions, and Survey Questions: An Improved Screening Method," presented by Dr. Stan Kaplowitz from MSU. Dr. Kaplowitz explained the development of a screening tool that would allow public health agencies to identify those children at a high risk of elevated blood lead levels. This method would be more cost effective than testing all children. This tool is available on the Internet at <http://midata.msu.edu/blf/>.
- (g) A member of the CEHS attended a seminar, "Fish-eating in Michigan: Pregnancy, Environment, and Child Health Studies" by Dr. Wilfried Karmaus, MSU, Department of Epidemiology. Dr. Karmaus presented information on

three Michigan fisheater cohorts exposed to PCBs and polybrominated biphenyls. Fathers with increased PCB exposure had increased numbers of boys, though studies have shown inconsistent findings of paternal impact on sex ratio. Other studies have shown that increased DDE exposure decreases breastfeeding, both initiation and duration. DDE *in utero* impacted menarche, causing decreased age for initiation. Other DDE research showed a mosaic of possible endocrine impacts, including increased age at menopause and increased fecundity.

Members of the CEHS participate with other subcommittees of the TSG to ensure that issues pertaining to children's environmental health are comprehensively addressed. Members of the CEHS serve on the Cancer Risk Assessment, Uncertainty Factors (UFs), Dioxin, Trichloroethylene (TCE), Probabilistic Risk Assessment (PRA), Lead, and Polybrominated Diphenyl Ether (PBDE) subcommittees.

III. Summary of Other TSG Subcommittee Activities

The following TSG subcommittees are charged with incorporating best available science into the development and review of environmental standards:

- Cancer Risk Assessment Subcommittee
Chair: Cathy Simon, AQD

No activity occurred in this subcommittee during the past year. However, the TSG invited speakers from the MDCH to present information on Genomics and Epidemiologic Cancer Cluster Investigations.

- UFs in Non-Cancer Risk Assessment Subcommittee
Chair: Bob Sills, AQD

This subcommittee is charged with determining if a UF for database insufficiency should be considered and applied, if appropriate, by MDEQ toxicologists when deriving non-cancer toxicity values, such as oral reference doses (RfDs) and inhalation reference concentrations (RfCs). This database UF (UF_d) is designed to account for the potential of deriving an under-protective RfD/RfC as a result of an incomplete characterization of a hazardous substance's toxicity. For example, traditional toxicity studies for specific chemicals or groups of chemicals often do not adequately evaluate reproductive, developmental, neurological, and immune system effects. These types of effects are those for which children, infants, and fetuses may be more susceptible and may occur at lower doses than the effects evaluated in traditional studies. If such data gaps exist, the UF_d (a value between 1 and 10) may be considered to address uncertainty in a calculated chronic RfD/RfC. The EPA frequently applies a UF_d when deriving RfDs and RfCs for chemicals determined to have inadequate information to characterize the risk for these effects. Current MDEQ practice for applying UFs in deriving *de novo* RfDs and RfCs does not include consideration of an UF_d.

Other UFs, generally a value between 1 and 10, used by MDEQ toxicologists, are intended to account for (a) the variation in sensitivity among the members of the human population, i.e., inter-individual variability; (b) the uncertainty in extrapolating animal data to humans, i.e., interspecies uncertainty; (c) the uncertainty in extrapolating from data obtained in a study with less-than-lifetime exposure to lifetime exposure, i.e., extrapolating from subchronic to chronic exposure; and (d) the uncertainty in

extrapolating from a lowest-observed-adverse effect level rather than from a no-observed-adverse effect level.

The subcommittee has completed a literature review. Over 70 scientific publications were reviewed. The subcommittee is currently drafting a report of its recommendations to the TSG.

- Dioxin Review Subcommittee

Chair: Deb Mackenzie-Taylor, Waste and Hazardous Materials Division (WHMD)

Subcommittee members participated in a meeting with The Dow Chemical Company and their consultants regarding the development of site-specific criteria for Midland and the Tittabawassee River and Floodplain dioxin contamination in May 2004. A draft bioavailability pilot study protocol was submitted for comments in July 2004. The MDEQ contracted with the Toxicology Excellence for Risk Assessment (TERA) to coordinate comments on this study protocol with outside experts.

- TCE Toxicity Assessment Review Subcommittee

Chair: Amy Merricle, RRD

The chair of this subcommittee attended the 2nd Mid-Western States Risk Assessment Symposium that was held in Indianapolis, Indiana on August 25-27, 2004. A TCE panel discussion, moderated by Michael Dourson (TERA), occurred at the conference.

TCE Panelist Members:

Dr. Jeri Higginbotham, Commonwealth of Kentucky
Paul Dugard, Halogenated Solvents Industrial Alliance
Dr. Robert Howd, California EPA
Dr. Lorenz Rhomberg, Gradient Corporation
Dr. Carl H. Stineman, Ecology and Environment, Inc.
Dr. Jeffrey Mendel, Exponent

TERA conducted a TCE state survey prior to the conference. Fifteen states participated in the survey, including Michigan. The introduction to the TCE toxicity panel discussion summarized the range of cancer slope factors being used for TCE reported by states that had participated in the survey. The most common slope factor reported by participating states to address drinking water exposure was the 4E-01 per mg/kg-d value presented in the EPA's 2001 Health Risk Assessment (HRA) document. However, a 30-fold difference in slope factors was reported. The most common inhalation slope factor reported by the participating states was also 4E-01 per mg/m³, although a 70-fold difference was reported. Most states were also using the same toxicity values for residential and industrial land use scenarios (13/15 states).

The criteria for TCE will remain unchanged department-wide at this time. The EPA has submitted its draft HRA for TCE to the National Academy of Sciences (NAS) for review. It will likely take up to 15 months at the NAS. Because the peer review process will have expired at the end of that time (statute of limitations), the HRA will have to go through another peer review process. It will likely be 2007 or 2008 before final toxicity values are published in Integrated Risk Information System. The subcommittee will continue to track the progress of the HRA review and any updates in the scientific literature regarding TCE toxicity.

- PRA Subcommittee
Chair: Deb Mackenzie-Taylor, WHMD

This subcommittee is charged with assisting in the development of staff guidance for evaluating PRAs submitted to the MDEQ and to assist with the review of this type of risk assessment as needed. A draft guidance on Monte Carlo analysis, a specific type of PRA, has been developed. Andrew Campbell, a Monte Carlo analysis expert contracted to develop the draft guidance, worked with other subcommittee members, who provided expertise in toxicology, risk assessment, and statistics to draft the guidance. This staff guidance will go through external peer review. When the guidance is completed after peer review, it will be used by MDEQ staff to evaluate Monte Carlo risk assessments. The first review will be the report entitled, *Calculation of a Site-Specific Soil Criterion for Midland, Michigan*, received April 11, 2002 from The Dow Chemical Company. The subcommittee will assist in the Monte Carlo aspects of the review.

In March 2005, the subcommittee plans to attend a workshop for PRA. It will be held at Michigan State University and is sponsored by the Society for Risk Analysis.

- Lead Subcommittee
Chair - Rochelle Inglis, RRD

To address lead contamination in Michigan, various state governmental agencies were called upon to take action and ensure that steps were being taken to reduce lead poisoning. The findings of the agencies were presented in a report entitled, *The State of Michigan's Childhood Lead Poisoning Prevention: A Call to Action* (2003). One charge (Directive 13) to the RRD concerning lead was to review the most recent toxicological and other pertinent data to determine if the current Part 201 residential cleanup criterion is protective and to determine the most appropriate method of soil sampling. The TSG Lead Subcommittee was formed to address this charge. The lead subcommittee report is presented as an attachment in, *State of Michigan Final Report of the Task Force to Eliminate Childhood Lead Poisoning* (June 2004). A summary of the recommendations is presented below.

The CDC blood intervention level of 10 µg/dl is used to derive the Part 201 drinking water criteria (DWC) and soil direct contact criteria (DCC) for lead. Some scientific data suggest that irreversible health effects occur in young children at blood lead levels below the CDC level. The CDC blood lead level of 10 µg/dl represents an intervention level (a level at which health effects are known to occur), which may not be appropriate for application in a program, such as the Part 201 cleanup program, whose primary objective is prevention.

As a result, the Lead Subcommittee determined that the current Part 201 DWC and soil DCC for lead may not be as protective as other Part 201 cleanup criteria that were derived with a preventive focus.

Consistent with soil sampling guidance prepared by the EPA Technical Review Workgroup (EPA, 2000), the Lead Subcommittee recommended that lead exposures be assessed based on concentrations of lead in the fine soil fraction (<250 microns). The fine fraction is considered the major pathway of exposure to lead in soil and dust. This statement is based upon the assumption that ingested soil and dust lead is best represented by the lead concentration in the particle size fraction that sticks to hands or that is most likely to accumulate in the indoor environment as a result of deposition of windblown soil and transport of soil on clothes, shoes, pets, toys, and other objects.

- PBDE Subcommittee
Chair: Christine Flaga, RRD

The PBDE subcommittee was created in 2003, in response to a request made by MDEQ management for recommendations regarding proposed legislation to ban PBDEs in Michigan. In January 2004, this subcommittee drafted a report that summarized all of the pertinent information available on PBDEs. The subcommittee sent the draft report to interested parties for comment and met with stakeholders to discuss the initial findings of the report. The subcommittee chairperson also presented the initial findings of the group at the *Fall 2004 Federal-State Toxicology and Risk Analysis Committee FSTRAC) Meeting* in Madison, Wisconsin on October 20-22, 2004. The subcommittee is currently redrafting the report to address comments and to include relevant information that has been published on PBDEs since the initial review. The draft report is expected to be completed in early 2005.

A member of the subcommittee also provided comments on House Bill 4406 and Senate Bill 1458. These bills concerned the banning of certain PBDEs.

- Clandestine Drug Lab Remediation Subcommittee
Chair: Erik Janus

The TSG created this new subcommittee in 2004, in response to a new state law 2003 PA 307, as amended (effective April 1, 2004), that requires the MDEQ and the enforcing agency (i.e., local building inspector) be notified by the state or local law enforcement agency regarding potential contamination of properties or dwellings that have been used for illegal drug manufacturing. The MDEQ is required to promulgate the rules and procedures necessary to carry out this new legislation. First and foremost, this includes writing a remediation standard for residual methamphetamine present in dwellings used as a clandestine lab.

To date, the subcommittee has conducted extensive literature searches, studied methods of production as well as adverse health effects data in humans, identified key dose-response data in animals, and regularly participates on the statewide methamphetamine task force. In 2005, the first cleanup level for illegal drug labs should be established (methamphetamine). The subcommittee may address other commonly manufactured drugs of abuse in the future, including LSD ("acid"), MDMA ("ecstasy"), and methcathinone.

IV. **Summary of TSG Actions in Response to the Directives Contained in the March 17, 2000 Memo from Director Harding**

Former MDEQ Director Harding indicated that the TSG should seek outside expertise from both industry and environmental health organizations as needed for specific issues. As an initial step to comply with this directive, a memo from prior MDEQ administration was mailed to a list of industrial associations, academic institutions, and environmental organizations. The memo requested assistance in identifying a pool of scientific experts in the areas of children's health, risk assessment, and toxicology from which the TSG could request outside expert advice. The response to this request was minimal. One response was received from a university identifying one individual. Another response was received from a company that identified an individual to serve as a liaison between this company and the TSG. No other responses have been received to date.

Since the initial effort to identify a pool of outside experts did not produce a significant response, the TSG recommended that efforts be made to identify qualified outside experts as specific issues arise.

V. Recommendations from Previous Reports

A review of the TSG recommendations from previous reports indicate all are still applicable. Efforts should continue to implement these recommendations as program priorities, staff time, and resources allow. A specific recommendation made by the TSG in the third annual report was for members to take advantage of education and outreach opportunities. In addition to the TSG Web site, activities identified this year with respect to this recommendation are as follows:

Outreach and education efforts continued when the CEHS chairperson was an invited speaker at an in-service training for school bus drivers. She gave a presentation on diesel exhaust reduction actions for reducing children's asthma triggers. Staff from the CEHS assisted with the combined Earth Day/Bring Your Child to Work Day event with booths on air quality and asthma and Clean School Bus USA. In addition, several members of the CEHS presented information to staff from Senator Liz Brater's office in May on how the MDEQ risk assessments consider children's health.

VI. Summary

The following progress has been made by the TSG on issues related to children's environmental health in fiscal years 2003 and 2004:

- The TSG has continued interactions with other state agencies including regular participation in the TSG and its subcommittees by representatives of the MDCH and MDA.
- The CEHS has been actively tracking changes made by other states and the federal government to address differences in children's exposure and sensitivity. Many TSG members have attended seminars, symposia, and other training opportunities to stay abreast of risk assessment and children's health issues.
- The TSG is evaluating the appropriateness of an additional UF to account for potential health effects, which have not been adequately studied, such as reproductive, developmental, neurological, and immunological effects.
- Review of dioxin and TCE toxicity values is ongoing to make sure that criteria for these chemicals are adequately protective of children's health using the best available science.
- The TSG is tracking changes by the EPA to better address exposure to chemical mixtures and cumulative risk.

Limited progress has been made on the following issues:

- Despite the development of an Air Toxics Monitoring Strategy, implementation of the strategy is unlikely due to a lack of funding. Better monitoring data is needed to help determine the most critical air toxics for human exposure, prioritize screening level updates, and track progress on efforts to reduce ambient levels of air toxics. Higher

priorities and limited staffing resources continue to impede progress on development and implementation of a comprehensive strategy for updating screening levels.

- The TSG and MESB Panel have identified several considerations for the MDEQ cleanup criteria that could be included to use the best available science to better protect for exposures to children and adults. These include:
 1. Direct contact criteria for soil with child-only exposure assumptions. These criteria have been developed but not implemented due to low priority.
 2. Evaluation of acute toxicity for exposure pathways that may have peak exposures. Chronic risk assessment methodologies may not adequately protect for acute toxicity in these situations for some chemicals. Evaluation of the current cleanup criteria for acute toxicity concerns has been given a low priority. This issue will only be addressed as criteria are revised or new criteria are developed.
 3. Consideration of other pathways of chemical exposure for those chemicals that are frequently found in food and other media. This issue has also been given a low priority for evaluating the current criteria and will only be addressed as criteria are revised or new criteria are developed.

Although some of these issues can be addressed as criteria are revised and new criteria are developed, use of more protective criteria when necessary to protect children's health is likely to be further delayed if the criteria cannot be implemented without rule promulgation. Even with this approach, many chemicals currently with criteria will not be evaluated due to limited staffing resources and prioritization.

- Although the TSG has been tracking changes made to federal drinking water standards, adoption of standards as they are changed is often delayed by two to four years for the cleanup and groundwater permitting programs since the regulation requires state drinking water standards to be used. The state must first promulgate new rules, once a federal standard is final. Frequently, the state of Michigan requires the maximum number of extensions to promulgate new rules adopting new drinking water standards, further delaying implementation of these standards in programs that should protect drinking water supplies for the people of the state of Michigan.
- Application of the best available science to consider chemical mixtures and cumulative risk continues to occur on a case-by-case basis. Limitations of staff time have precluded the pursuit of a broader, systematic approach.